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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/669,098	09/24/2003	Manabu Ishikawa	50395-229	1843

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Washington, DC 20005-3096

EXAMINER

CHIEM, DINH D

ART UNIT	PAPER NUMBER
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2883

DATE MAILED: 06/16/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/669,098

Applicant(s)

ISHIKAWA ET AL.

Examiner

Erin D. Chiem

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 March 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,4 and 9-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,4 and 9-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This office action is in response to applicant's request for continued examination filed on March 27, 2006. Currently claims 1, 4, and 9-12 are pending and claims 2-3 and 5-8 have been canceled.

Response to Arguments

Upon further search and reconsideration of the substantial amendment, examiner has taken applicant's remarks into consideration and new grounds of rejection are made below.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

- Claims 1, 9, and 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gilliland (US 6,206,582 B1 "Gilliland" hereinafter) in view of Anderson et al. (US 2002/0122636 A1 "Anderson" hereinafter).

Regarding claim 1, Gilliland discloses in Figs. 2 and 3 an optical module comprising an optical subassembly including a semiconductor optical device (126); a substrate securing an optical subassembly and mounting a circuit (102) for driving the semiconductor optical device; a

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metal base (100) enclosing the optical subassembly, the circuit on the substrate being exposed within the housing (146); a metal cover (128); a thermal block (116) arranged in the metal base (100) so as to plug the opening of the base to be in thermally contact with the circuit and the metal cover for conducting heat generated by the circuit, the thermal block having an outer surface with a shape fitting the inner (112) surface of the opening, wherein the thermal block is secured by pressing the outer surface thereon the inner surface of the opening by the cover.

However, Gilliland does not explicitly disclose an inner surface sloping to the substrate nor does Gilliland disclose a thermal sheet put between the thermal block and the circuit.

It would have been obvious matter of design choice to form the base providing an opening with an inner surface sloping to the substrate to reduce the outer surface dimension, since such a modification would have involved a mere change in the size of a component. A change in size is generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 105 USPQ 237. It is respectfully noted that applicant has not disclosed any criticality in the sloping of the inner surface such that the sloping alters the function of the optical module. Examiner's contention of this obvious choice in design can be overcome if applicant establishes unexpected results by reducing the size of the module as claimed. The motivation for reducing the size of the substrate by slopping the inner surface is to provide guidance for the plug-in.

Anderson discloses in Fig. 7B an optoelectronic mounting having a flexible printed circuit (paragraph [0088] and reference element '102') being in contact with the heat producing optical component (106) and thermally coupled the substrate (104) to dissipate heat.

Although Gilliland refers to the flexible members (144, 142, 146) as "pins" however, Fig. 3 clearly suggests the "pins" may be flexible conductors. Thus, it would have been obvious to

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one having ordinary skill in the art to recognize Anderson's flexible printed circuit that is capable of conducting heat may be used in place of Gilliland's "pins" to provide the electrical connectivity and thermal conduction between the thermal block and the circuit. **The motivation** to utilize the flexible printed circuit, as disclosed by Anderson, is to reduce the number of components, simplify assembly of the module, and reduce cost when one component may function as an electrical conductor and a thermal conductor.

Regarding claim 9, Gilliland discloses the housing (116) (thermal block) may be made of metal or non-metallic material and metallized with stainless steel or copper (col. 5 line 64 to col. 6, line 7).

Regarding claim 11, Gilliland discloses a vertical cavity-emitting laser as being an element of the optical device (126); see col. 5, line 40.

Regarding claim 12, Gilliland discloses an opening provided in the base and the thermal block plugged in the opening electrically partitions a space within the optical module by being in contact with the circuit on the substrate and the cover.

However, Gilliland does not explicitly disclose the opening is formed nearly center of base.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to arrange the opening nearly center of the base, since it has been held that rearranging of parts of an invention involves only routine skill in the art. *In re Japikse*, 86 USPQ 70. It is respectfully noted that applicant has not disclosed any criticality in the placement of the

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substrate in the Specification. The centering of the opening on the base to one having ordinary skill in art would be a common optimum design to provide balanced weight and optimum usage of space. Examiner's contention of this obvious choice in design can be overcome if applicant establishes unexpected results by arranging the substrate in the location as claimed.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gilliland in view of Anderson as applied to claim 1 above, and further in view of Inoue et al. (US 6,703,702 B1 "Inoue" hereinafter).

The combination of Gilliland and Anderson discloses the invention of claim 1. Anderson indicated the flexible printed circuit is made of plastic and does not explicitly disclose the flexible printed circuit is made of resin.

Inoue discloses the thermal sheet is made of resin [0065] and furthermore, the flexible printed circuit comprises polyimide resin sandwiching a copper layer [0068].

It would have been obvious to one having ordinary skill in the art to recognize Anderson's disclosure of the thermally conductive flexible printed circuit is made of resin, as specified by Inoue. **The motivation** for using polyimide resin for the thermal sheet is the preferable heat tolerance characteristic of this particular resin.

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gilliland in view of Anderson as applied to claim 1 above, and further in view of Knox et al. (US 6,668,126 B1 "Knox" hereinafter).

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The combination of Gilliland and Anderson discloses the invention of claim 1. Gilliland indicated the housing (112, 116, and 126) is made of metallized plastic and does not explicitly disclose the base is made of resin.

Knox discloses in claim 14, that the housing is formed of a plastic resin molding col. 5, lines 36-43).

It would have been obvious at the time of the invention to one having ordinary skill in the art to recognize Knox disclosure is a specific type of plastic that may be used for Gilliland's module. The motivation for using plastic resin for the base of is for the ease of manufacturing since resin is easy to mold such as the method injection molding to form the base or housing.

Contact Information


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Erin D. Chiem whose telephone number is (571) 272-3102. The examiner can normally be reached on Monday - Thursday 9AM - 5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank G. Font can be reached on (571) 272-2415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Erin D Chiem
Examiner
Art Unit 2883


Frank G. Font
Supervisory Primary Examiner
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